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ELECTROTECHNICAL VOCABULARY

PART LII DATA PROCESSING

Section 10 Data Communication

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ELECTROTECHNICAL VOCABULARY
PART LII DATA PROCESSING
Section 10 Data Communication

0. FOREWORD

0.1 This Indian Standard (Part LII/Sec 10) was adopted by the Indian Standards Institution on 15 September 1980, after the draft finalized by the Basic Standards on Electronics and Telecommunication Sectional Committee, in consultation with Computers, Business Machines and Calculators Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 Electronic data processing is utilized for numerous exchanges and analysis of information of both intellectual and material nature. Application of electronic data processing becomes difficult, either because of the great variety of terms used in various fields to express the same concept, or because of the absence of or the imprecision of useful concepts. To overcome these barriers, this standard has been formulated.

0.3 This standard is one of the series of twenty Indian Standards on data processing vocabulary, constituting Part LII of the electrotechnical vocabulary, which deals with the main areas of data processing classified under the following heads:

Section 1 Fundamental terms
Section 2 Arithmetic and logic operations
Section 3 Equipment technology
Section 4 Organization of data
Section 5 Representation of data
Section 6 Preparation and handling of data
Section 7 Digital computer programming
Section 8 Control, input-output and arithmetic equipment
Section 9 Data media, storage and related equipment
Section 10 Data communication
Section 11 Operating techniques and facilities
Section 12 Information theory
Section 13 Analogue and hybrid computing

Section 14 Computer graphics and computer micrographics
Section 15 Programming languages
Section 16 Data bases
Section 17 Data structures
Section 18 Information systems characteristics and development
Section 19 Reliability, maintenance and availability
Section 20 Control and integrity

0.4 Prime importance has been given to simplicity and clarity of the definitions so that they may be understood by all. It may, therefore, be felt that some definitions do not cover all the cases and exceptions.

0.5 Assistance has been derived in formulating this standard from draft International Standard ISO 2382 'Data processing — Vocabulary — Section 10 Data communication, prepared by the International Organization for Standardization'.

1. SCOPE

1.1 This standard (Part LII/Section 10) covers terms related to data communication as used in data processing.

2. GENERAL TERMS

2.1 Data Communication — Data transfer between data source and data sink via one or more data links according to a link protocol.

2.2 Data Transmission — The conveying of data from one place for reception elsewhere by signals transmitted over a channel.

2.3 Teleprocessing — Data processing by means of a combination of computers and data communication facilities.

2.4 Telecommunication — Communication at a distance, as by telegraph or telephone.

2.5 Data Transmission Interface — A shared boundary defined by common physical interconnection characteristics, signal characteristics, and functional characteristics of the interchange circuits.

2.6 Time Frame — A defined structure, based on recurring events, imposed on time.

3. NETWORK TERMS

3.1 Node — In a data network, a point where one or more functional units interconnect data transmission lines.

3.2 Branch — In a data network, a route between two directly connected nodes.

3.3 Path — In a data network, a route between any two nodes.

3.4 Terminal Port — A functional unit of a node through which data can enter or leave a data network.

4. TRANSMISSION METHODS

4.1 Synchronous Transmission — A mode of data transmission such that the time of occurrence of each signal representing a bit is related to a fixed time frame.

4.2 Asynchronous Transmission — A mode of data transmission such that the time of occurrence of the start of each character, or block of characters, is arbitrary; once started, the time of occurrence of each signal representing a bit within the character, or block, has the same relationship to significant instants of a fixed time frame.

4.3 Start-Stop Transmission — Asynchronous transmission such that a group of signals representing a character is preceded by a start element and is followed by a stop element.

4.4 Start Element/Start Signal — In a start-stop transmission, a signal, indicating the beginning of a character, and which is transmitted for the nominal duration of one signal element.

4.5 Stop Element/Stop Signal — In a start-stop transmission, a signal transmitted immediately after a character; for the nominal duration of one- or two-signal element.

4.6 Parallel Transmission — The simultaneous transmission of a group of bits constituting a character or other entity of data.

4.7 Serial Transmission — The sequential transmission of a group of bits constituting a character or other entity of data.

4.8 Burst Transmission — A method of operating a data network by interrupting, at intervals, the transmission of data.

NOTE — The method enables communication between data terminal equipments.

4.9 One-Way Communication — A mode of data communication such that information is transferred in one pre-assigned direction.

NOTE — *See* Table 1.

TABLE 1 USE OF DEFINED TERMINOLOGY

(*Clause* 4.9)

	CONTEXT	DATA COMMUNICATION	DATA TRANSMISSION	
		Data Link	Data Circuit	Channel
Transmission capability	Duplex	NA	P	NP
	Half Duplex	NA	P	NP
	Simplex	NA	P	P
User mode	Both-way	P	NA	NA
	Either-way	P	NA	NA
	One-way	P	NA	NA

NA = not applicable (use deprecated in given context)

NP = not possible

P = possible

4.10 Simplex Transmission — Data transmission over a data circuit in one pre-assigned direction only.

NOTE — *See* Table 1.

4.11 Either-Way Communication/Two-Way Alternate Communication — A mode of data communication such that information is transferred in both directions, one direction at a time.

NOTE — *See* Table 1.

4.12 Half-Duplex Transmission — Data transmission over a data circuit in either direction, one direction at a time; the choice of direction is controlled by the data terminal equipment.

NOTE — *See* Table 1.

4.13 Both-Way Communication/Two-Way Simultaneous Communication — A mode of data communication such that information is transferred simultaneously in both directions.

NOTE — *See* Table 1.

4.14 Duplex Transmission — Data transmission over a data circuit in both directions at the same time.

NOTE — *See* Table 1.

4.15 Modulation Rate — The reciprocal of the measure of the shortest nominal time interval between successive significant instants of the modulated signal.

Note — If this measure is expressed in seconds, the modulation rate is given in bauds.

4.16 Data Signalling Rate — The rate at which data are transmitted or received by a data terminal equipment.

Note — The data signalling rate is expressed as a number of bits per second.

4.17 Effective Data Transfer Rate — In data communication, the average number of bits, characters, or blocks per unit time transferred from a data source and accepted as valid by a data sink.

Note — The data transfer rate is usually in bits, characters or blocks per second, minute, or hour.

4.18 Actual Data Transfer Rate — In data communication, the average number of bits, characters, or blocks per unit time transferred from a data source and received by a data sink.

4.19 Message (In Data Communication) — A group of characters and control bit sequences transferred as an entity, from a data source to a data sink, whose arrangement of characters is determined by the data source.

4.20 Packet — Data and a sequence of control bits arranged in a specified format and transferred as an entity that is determined by the process of transmission.

4.21 Message Switching — The process of routing messages by receiving, storing, and forwarding complete messages within a data network.

4.22 Circuit Switching — A process that, on demand, connects two or more data terminal equipments and permits the exclusive use of a data circuit between them until the connection is released.

4.23 Packet Switching — The process of routing and transferring data by means of addressed packets so that a channel is occupied during the transmission of the packet only, and upon completion of the transmission the channel is made available for the transfer of other packets.

4.24 Virtual Circuit (Connection) — In a data network operating in packet mode, those facilities provided by the network for transferring data between data stations that emulate facilities provided by a physical connection.

5. LINES AND DATA LINKS

5.1 Data Transmission Line — A medium for transferring signals over a distance.

5.2 Data Network — The assembly of functional units that establishes data circuits between data terminal equipments.

5.3 Data Link — The assembly of parts of two data terminal equipments that are controlled by a link protocol, and that, together with the interconnecting data circuit, enables data to be transferred from a data source to a data sink.

5.4 Data Circuit — A means of data transmission between two data terminal equipments.

NOTE — *See* Fig. 1.

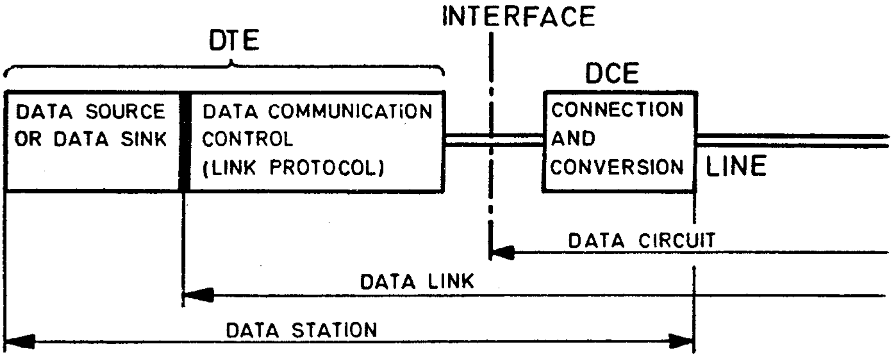

FIG. 1 DATA TRANSMISSION SET-UP

5.5 Channel — In data transmission, a means of simplex transmission in a pre-assigned direction.

5.6 Forward Channel — That channel of a data circuit on which data may be transferred from the data source to the data sink.

5.7 Backward Channel — That channel of a data circuit on which acknowledgements or other control data may be transferred in a direction opposite to that of its associated forward channel.

5.8 Circuit Switched Connection — A connection that is established on demand between two or more data stations in order to allow the exclusive use of a data circuit until the connection is released.

5.9 Multipoint Connection — A connection established between three or more data stations.

NOTE — The connection may include switching facilities.

5.10 Point-to-Point Connection — A connection established between only two data stations.

NOTE — The connection may include switching facilities.

5.11 Leased Circuit (Connection) — A connection established without the use of switching facilities, for the exclusive use of two or more data stations.

6. PROCEDURES AND OPERATIONS

6.1 Link Protocol — A set of rules for data communication over a data link specified in terms of a transmission code, a transmission mode and control and recovery procedures.

NOTE — *See* Fig. 1.

6.2 Code-Independent Data Communication — A mode of data communication that uses a character-oriented link protocol that does not depend on the character set or code used by the data source.

6.3 Code-Transparent Data Communication — A mode of data communication that uses a bit-oriented link protocol that does not depend on the bit sequence structure used by the data source.

6.4 Packet Mode — A manner of operating a data network by means of packet switching.

6.5 Message Mode — A manner of operating a data network by means of message switching.

6.6 Store-and-Forward Mode — A manner of operating a data network in which packets or messages are stored before transmission to the ultimate destination.

6.7 Recovery Procedure — In data communication, a process whereby a specified data station attempts to resolve conflicting or erroneous conditions arising during the transfer of data.

6.8 Error Control (Procedure) — In data communication, that part of the link protocol controlling the detection, and possibly the correction, of transmission errors.

6.9 Block Check (Procedure) — That part of the error control procedure used for determining that a data block is structured according to given rules.

6.10 Contention — A condition arising when two or more data stations attempt to transmit at the same time over a shared channel, or when two data stations attempt to transmit at the same time in either-way communication.

NOTE — By extension, contention can arise in a computer that can deal with only one data source at a time.

6.11 Calling — The process of transmitting address signals in order to establish a connection between data stations.

6.12 Answering — The process of responding to a calling station to complete the establishment of a connection between data stations.

6.13 Interrogation — The process whereby a master station requests a slave station to identify itself or give its status.

6.14 Polling — The process whereby data stations are invited at a time to transmit.

6.15 Selecting — The process of inviting one or more data stations to receive.

6.16 Packet Sequencing — A process of ensuring that packets are delivered to the receiving data station in the same sequence as they were received by the data network from the sending data station.

7. TERMINAL EQUIPMENT

7.1 Data Source — That part of data terminal equipment that enters data into a data link.

NOTE — *See* Fig. 1.

7.2 Data Sink — That part of data terminal equipment that receives data from a data link.

NOTE — *See* Fig. 1.

7.3 Data Terminal Equipment (DTE) — The functional unit of a data station that serves as a data source or a data sink and provides for the data communication control function to be performed in accordance with link protocol.

NOTE — *See* Fig. 1.

7.4 Data Circuit-Terminating Equipment (DCE) — The functional unit of a data station that establishes, maintains and releases a connection and provides those functions necessary for any code or signal conversion between the data terminal equipment and the data transmission line.

NOTE — *See* Fig. 1.

7.5 Modem — A functional unit that modulates and demodulates signals.

NOTE — One of the functions of a modem is to enable digital data to be transmitted over analog transmission facilities.

7.6 Data Multiplexer — In data transmission, a functional unit that permits two or more data sources to share a common transmission medium such that each data source has its own independent channel.

7.7 Data Concentrator — In data transmission, a functional unit that permits a common transmission medium to serve more data sources that there are channels currently available within the transmission medium.

7.8 Data Station — The set of functional units that consists of the data terminal equipment, the data circuit-terminating equipment and their common interference.

NOTE -- *See* Fig. 1.

7.9 Control Station — In a multipoint or a point-to-point connection, that data station which nominates the master station and supervises polling, selecting, interrogating and recovery procedures.

7.10 Tributary Station — In a multipoint connection, any data station other than the control station.

7.11 Master Station — That data station which has accepted an invitation to ensure data transfer to one or more slave stations.

NOTE — At a given instant there can be only one master station on a data link.

7.12 Slave Station — A data station that is selected by a master station to received data.

7.13 Passive Station — In a multipoint connection, any tributary station waiting to be polled or selected.

7.14 Primary Function — The function that allows a data station to exert overall control of the data link according to the link protocol.

7.15 Secondary Function — The function that allows a data station to respond to commands according to the link protocol.

7.16 Primary Station — A data station that can perform the primary function but not the secondary function.

7.17 Secondary Station — A data station that can perform the secondary function, but not the primary function.

7.18 Combined Station/Balanced Station — A data station that can perform the primary function and the secondary function.

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NOTE — This index has been prepared in accordance with IS : 1275-1958*. Index numbers are clause numbers.

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INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg. m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m^2

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